

## **REMARKS**

In response to the above-identified Office Action, Applicant traverses the Examiner's rejection to the claims and seeks reconsideration thereof. Claims 1-5 are now pending in the present application. In this response, Claims 1-5 have been amended, no claims have been added and no claims have been cancelled.

### **Claim Amendments**

Applicant respectfully submits the attached claim amendments do not add new matter and requests they be entered accordingly. Applicant amends Claim 1 to clarify that the analyzer crystal and detector are rotatable "as a unit." Support for the amendment to Claim 1 is found on page 8, lines 14-22. Claims 2-5 have been amended to include commas.

### **Drawing Objections**

In the outstanding Office Action, the Examiner objects to the drawings for failing to comply with 37 CFR 1.84(p)(5) because they include reference characters "24", "26", and "28", not mentioned in the description. The Examiner further objects to the drawings for failing to include character "38" as mentioned in the description. Lastly, the Examiner objects to Fig. 2 because reference text "2" should be replaced by "2ω'." Thus, Applicant respectfully submits the attached amendments to the drawings in which character "2" in Figure 2 has been amended to recite "2ω'" and character "38"

has been added to Figures 3 and 6. Approval of the drawing amendments is respectfully requested.

### **Specification Objections**

In the outstanding Office Action, the Examiner objects to the specifications on the basis that there are no section headings and further that page 8, line 17, character "32" should be replaced by "34." Applicant respectfully disagrees with the Examiner's objection on the basis that there are no section headings. Applicant respectfully submits section headings for the "DESCRIPTION", "CLAIMS" and "ABSTRACT" are clearly recited in the specification. See Application, pages 1, 12 and 13. Thus, Applicant respectfully requests the Examiner withdraw the objection to the specification for lack of section headings. In response to the remaining objections, Applicant respectfully submits the attached amendment to the specification in which character "32" on page 8, line 17, has been amended to recite "34" and page 8, lines 26-28 and 32 have been amended to include characters "24", "26" and "28" to correspond with Figures 3 and 6.

### **Claim Rejections – 35 U.S.C. §102(e)**

In the outstanding Office Action, Claims 1-4 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,226,349 issued to Schuster et. al. ("Schuster"). In addition, Claims 1-5 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 4,364,122 issued to Wolfel et. al. ("Wolfel").

It is axiomatic that to anticipate a claim, every element of the claim must be disclosed within a single reference. *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Furthermore, the reference must disclose the identical invention in as complete detail as is found in the claim. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

The present invention claims an X-ray diffractometer, comprising, a sample stage for mounting a sample, the sample stage being rotatable about an axis, a double pinhole collimator for directing X-ray radiation to a sample on the sample stage, a detector for detecting X-rays diffracted by the sample, and an analyzer crystal arranged between the sample stage and the detector to direct X-rays diffracted by the sample onto the detector, wherein the analyzer crystal and detector are rotatable as a unit about an axis that is coaxial with the axis of rotation of the sample stage.

**Schuster, U.S. Patent No. 6,226,349**

Applicant respectfully submits Schuster fails to teach or suggest at least the elements of a double pinhole collimator used to direct radiation onto the sample, an analyzer crystal and detector used to detect radiation, and wherein the analyzer crystal and detector are rotatable as a unit about an axis that is coaxial with the axis of rotation of the sample stage, as is recited in Claim 1. In particular, the Examiner combines slits 14, 15 which appear in Figure 1 with the analyzer crystal 30, 35 which only appear in

the embodiments of Figures 8 and 9. Thus, the Examiner has not pointed to where within Schuster the arrangement in which a double pinhole collimator used to direct radiation onto the sample, an analyzer crystal and detector used to detect radiation, and wherein the analyzer crystal and detector are rotatable as a unit about an axis that is coaxial with the axis of rotation of the sample stage is taught or suggested.

Furthermore, there is no teaching or suggestion in Schuster that the elements relied upon by the Examiner to teach a detector 29 and analyzer crystal 30, 35 are rotatable as a unit.

Moreover, Applicant respectfully disagrees with the Examiner's characterization of double slits 14, 15 of Figure 1 as a double pinhole collimator. A double pinhole collimator is a particular kind of collimator, which collimates X-rays using two pinholes. It does not collimate X-rays using a crystal such as crystal 5 of Figure 1. Unlike Schuster, the present invention provides for a high resolution diffractometer without the need for a monochromator crystal or analyzer crystal between the source and the sample stage. Instead, a simple collimator, namely a double pinhole collimator may be used. Thus, the avoidance of the need for an analyzer crystal, such as crystal 5, makes the instrument both cheaper and easier to set up and therefore highly beneficial in a production line environment. In addition, Applicant's claimed arrangement shows excellent resolution approaching that claimed using a multiple crystal diffractometer using only two crystals, and a simple, and hence cheap, double pinhole collimator.

Applicant's exceptional results are discussed on pages 9 and 10 with reference to Figure 5 of the Application. In addition to the above-referenced advantages of Applicant's invention over the prior art, Applicant's arrangement allows the user to work with rough samples. Schuster, and specifically the arrangement of Figure 8, is stated to be for "thin layers and smooth surfaces" at column 11, line 37.

In regard to dependent Claims 2-4, Claims 2-4 depend from Claim 1 and incorporate the limitations thereof. Thus, for the reasons discussed with respect to Claim 1, Schuster does not teach or suggest all the limitations of Claims 2-4 therefore anticipation may not be found.

**Wolfel, U.S. Patent No. 4,364,122**

Applicant respectfully submits Wolfel fails to teach or suggest at least the elements of a double pinhole collimator used to direct radiation onto the sample and wherein an analyzer crystal and detector are rotatable as a unit about an axis that is coaxial with the axis of rotation of the sample stage as recited in Claim 1. The Examiner alleges elements 58 and 60 of Wolfel teach Applicant's claimed double pinhole collimator. Applicant respectfully submits, elements 58 and 60 are characterized in Wolfel as a diaphragm and scatter slot, respectively. A diaphragm and scatter slot are not the same as a double pinhole collimator. As previously discussed, a double pinhole collimator is a particular kind of collimator which collimates X-rays using two pinholes,

not a diaphragm and scatter slot. Moreover, there is no teaching or suggestion in Wolfel that elements 52 and 70, as relied upon by the Examiner to teach Applicant's claimed detector and analyzer crystal, are rotatable as a unit about an axis that is coaxial with the axis of rotation of the sample stage. Instead, Wolfel teaches that the secondary monochromator 70 is supported by a swivel mount support 66 which rotates along an inner circle concentric to the goniometer circle 46. See Wolfel, col. 5, lines 43-50. As illustrated in Figure 4, the axis of support 66 is separate and therefore not coaxial with the axis 48 referenced by the Examiner as being the sample stage axis of rotation 48. Thus, Wolfel does not teach or suggest at least the elements of a double pinhole collimator and a detector and analyzer crystal rotatable as a unit about an axis that is coaxial with the axis of rotation of a sample stage. Accordingly, Wolfel does not anticipate Claim 1 and Applicant respectfully requests withdrawal of the Examiner's rejection of Claim 1 over Wolfel.

In regard to dependent Claims 2-5, Claims 2-5 depend from Claim 1 and incorporate the limitations thereof. Thus, for the reasons discussed with respect to Claim 1, Wolfel does not teach or suggest all the limitations of Claims 2-5 therefore anticipation may not be found.

#### Claim Rejections – 35 U.S.C. §103(a)

The Examiner rejected Claim 5 under 35 U.S.C. 103(a) as being unpatentable over Schuster in view of U.S. Patent No. 5,878,106 issued to Fujiwara ("Fujiwara").

To render a claim obvious, the relied upon references must disclose every limitation of the claim such that the invention as a whole would have been obvious at the time the invention was made to one skilled in the art. MPEP §2143. Furthermore, there must be a showing of suggestion or motivation to modify or combine the teachings of those references. *In re Rouffet*, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457-58 (Fed. Cir. 1998). Hindsight must be avoided and instead a conclusion of obviousness must be based on the facts found in the prior art. *In re McLaughlin*, 443 F.2d 1392, 1395, 170 USPQ 209, 212 (CCPA 1971).

In determining Claim 5 is obvious over the cited references, the Examiner relies on the previous characterization of Schuster however concedes that Schuster does not disclose Applicant's claimed X-ray diffractometer further comprising a drive for rotating the sample stage and the detector and analyzer crystal. The Examiner relies on Fujiwara to cure the defects of Schuster in determining Fujiwara discloses an x-ray diffractometer that comprises a drive 10, 17 for rotating the sample stage 5 and the detector 13 with a ratio of rotation angles of substantially 1:2, 22. The Examiner further determines it would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ a drive for rotating the sample stage and the detector and analyzer crystal, since a person would be motivated to automate the process of data acquisition.

Applicant respectfully submits, Claim 5 is dependent upon Claim 1 and incorporates the limitations thereof. As previously discussed, Schuster fails to teach or suggest a double pinhole collimator used to direct radiation onto the sample, an analyzer crystal and detector used to detect radiation, and wherein the analyzer crystal and detector are rotatable as a unit about an axis that is coaxial with the axis of rotation of the sample stage. Thus, for at least the reasons discussed above with respect to Claim 1, Schuster fails to teach each element of Claim 5. Similarly, the Examiner has not set forth, and Applicant is unable to discern, any portion of Fujiwara teaching a double pinhole collimator used to direct radiation onto the sample, an analyzer crystal and detector used to detect radiation, and wherein the analyzer crystal and detector are rotatable as a unit about an axis that is coaxial with the axis of rotation of the sample stage.

Moreover, the Examiner has not provided a sufficient motivation for combining the references. The Examiner merely states the relied upon combination of Schuster and Fujiwara would have been obvious to one of ordinary skill in the art “since a person would be motivated to automate the process of data acquisition.” As the Examiner is no doubt aware, where the references do not suggest the claimed invention, the Examiner has the burden of presenting a convincing line of reasoning as to why the artisan would have found the claimed invention to be obvious based upon the cited references. *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985). In stating



that the combination would have been obvious to the skilled artisan because a person would be motivated to automate the process, the Examiner has not satisfied this burden. Thus, for the foregoing reasons the Examiner's reliance on Schuster in view of Fujiwara in rendering Claim 5 obvious is inappropriate. Applicant therefore respectfully requests withdrawal of the rejection.

### **Double Patenting**

In the outstanding Office Action, the Examiner rejects Claims 1, 2 and 5 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-3 of U.S. Patent No. 6,731,719 B2. The Examiner acknowledges that the claims are not identical however finds they are not patentably distinct from each other. Applicant respectfully submits herewith a terminal disclaimer in compliance with 37 CFR 1.321(c) and fee in the amount of \$130.00 pursuant to 37 CFR 1.20(d).

### **CONCLUSION**

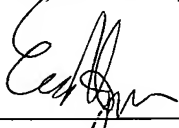
In view of the foregoing, it is believed that all claims now pending are now in condition for allowance and such action is earnestly solicited at the earliest possible date. If there are any additional fees due in connection with the filing of this response,

please charge those fees to our Deposit Account No. 02-2666. Questions regarding this matter should be directed to the undersigned at (310) 207-3800.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR, & ZAFMAN LLP

Dated: 2/2/05

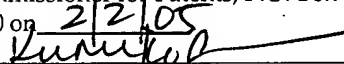
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